ELMF REPORT

Going Mobile

Since the early 2000s terrestrial laser scanning has rapidly evolved from a research and development topic into a geo-data technology available in the general marketplace. Cultural heritage, bridges, plants, cars, coastal cliffs, highways, traffic-collision damage, all can be accurately modelled using laser technology, and although this has matured, new developments are still coming out. The European Lidar Mapping Forum (ELMF) held from 30th November to 1st December 2010 in The Hague, Netherlands, convincingly demonstrated that terrestrial laser scanning is going mobile.

Together with other measuring devices, lasers scanners are being increasingly mounted on vehicles for data capture on the move along roads or sailing. As with any evolving technology, such systems are baptised with a variety of names including: ‘mobile laser scanning', ‘mobile terrestrial laser scanning' and ‘mobile mapping system'. But given the current trend for mounting other sensors side by side with laser scanners (or you can look at it the other way around and describe digital photogrammetric cameras getting chummy with laser scanners), the most appropriate term in my view is ‘mobile mapping system' (MMS).

Mobile

A mobile mapping system consists basically of a car, van or boat equipped with a positioning system: GNSS receiver integrated with Inertial Measurement Unit (IMU), and laser scanners. Digital cameras, thermal sensors, or other geo-data capturing systems may also be mounted on the roof rack. For inspecting the condition of construction surfaces such as road asphalt, ground penetrating radar sensors may also be attached to the vehicle. In urban areas GNSS satellite signals may be blocked by high-rise buildings and other tall objects (urban canyons). To bridge this time it may be beneficial to attach odometers to the vehicle wheels to improve the geometric quality of final data. These three redundant positioning technologies - GNSS, IMU and odometers - enable accurate positions to be obtained of laser and other sensors while on the move acquiring data. All devices are connected to a control unit from which the operator steers the capture of 3D coordinates of millions of points. In order to save costs it is important to minimise the time needed to mount, install and set up all devices. The cost per kilometre of surveying by means of MMS is falling by the year.

Highways

The coming out of MMS is accelerated thanks to practitioners like highway managers who are in need of fast and cost-effective data-capture systems. The availability of MMS in turn reshapes the Lidar mapping market, allowing the introduction of new applications and end-customers. The main application of high commercial potential is mapping of highways and other roads necessary for construction, maintenance, safety and environmental purposes. Surveying of roads by traditional means is a time and resource consuming task. MMS makes it possible to acquire up to one billions points per hour, together with tens of gigabytes of imagery. Field trials have shown that accuracies of up to one centimetre can be achieved.

So high-quality geometric information about objects on, above and alongside roads can be extracted from dense point-clouds. Data capture from a vehicle moving at 100 kilometres p er hour is just the first link in the chain of providing the user with proper information. The resultant huge volumes of data require dedicated software to manage and analyse the billions of points. To speed up the cumbersome manual extraction of features, much is being done to develop software for automatic extraction of road signs, roadsides and the like; research institutes are doing a lot of work in this realm. To allow access to the data any time, anywhere by a wide range of professionals and other users, a web-portal consisting of at least a web-based viewer should be employed.

Conference and Exhibition

ELMF, organised by Intelligent Exhibitions, is the European counterpart of the International Lidar Mapping Forum (ILMF) annually held in the US; the eleventh in the series to take place this, 2011, from 7th to 9th February in New Orleans. The main attraction of the ELFM event

in The Hague was the exhibition floor, where system and sensor manufacturers, surveying companies, data processers, software vendors and other specialists could network in an informal setting. Part of the exhibition took place outdoors, where seven companies showcased their mobile mapping systems mounted on cars or vans. Alongside the exhibition a two-track technical conference was held, during which company representatives reported on their latest technological advances and highlighted the experience of recent projects.

A number of university researchers reported their findings and progress on specialised topics. Lidar arena novices could attend workshops to learn more about the nitty-gritty of the technology. According to the organisers, ELFM attracted over six hundred participants. From the academic side I received complaints that the fee of Euro 500 was actually too high for a two-day conference. To be honest, ELMF is not the place to be for scientists wanting to exchange research progress and ideas; the main function of the event is to provide an in-depth overview of the market penetration status of Lidar technology.

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